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SCIENCE.

FRIDAY, OCTOBER 26, 1883.

THE VIVISECTION QUESTION.

THE book we take as the basis of our remarks,[1] originally published in England, is one of several recent signs that British physiologists are at last coming to their senses; and, instead of attempting to conceal the fact that they experiment on animals, have decided to explain to the general public what a vivisection is, and why vivisections are necessary. Philanthropos, who is evidently well informed, discusses without passion or prejudice such topics as, 'What is pain?' 'What is cruelty?' 'Our rights over animals,' 'What is vivisection?' 'The relation of experiment to physiology,' 'The relation of medicine to experiment,' and so forth. If our colleagues across the water had, some seven or eight years ago, shown sufficient courage to trust to the common sense of the majority of their countrymen, and had endeavored to inform the laity by securing the publication and distribution of some such book as this, the anti-vivisection legislation could hardly have been enacted. Its passage, and the still-continued agitation for an act of Parliament totally forbidding all experiment on living animals, prove that the public did not and does not know enough about the matter to save itself from being misled by the reckless misstatements of irresponsible fanatics, and of certain seekers after notoriety or salary.

People in general do not read official blue-books: so, in spite of the fact that the royal commission appointed to investigate the matter reported, that, after prolonged and careful inquiry, it could find no evidence that English physiologists were guilty of cruelty, it has been possible for certain anti-vivisectors, by a persistent course of malignant vituperation and brazen mendacity, to produce a wide-spread belief that vivisection essentially consists in torturing an animal for the object of seeing how much it can suffer without dying. That such is the actual conviction of many worthy men and women in England, we know to be the case. The physiologists kept silent, and left the field to their enemies, with disastrous result; no one, not a brute, who believed half the stories circulated, could fail to hate physiology and physiologists. When the railroad-stations of England were placarded with large figures of dissections of dead animals, accompanied by printed words designed to entrap the general public into the belief that they represented vivisections of living creatures; when a text-book of practical physiology, designed only for special students of physiology, was represented far and wide as intended for use by every crude medical student; when the fact that the words 'first give an anaesthetic' were omitted (as they are in text-books of surgery, the administration of an anaesthetic being, of course, assumed in cases where very special reasons for its omission do not exist) in the directions for the performance of certain operations, was used as proof that physiologists never thought of employing means to prevent or minimize pain; when a law was passed which allows any one to torture a frog in the most brutal manner if he says he does it just because he likes it, but subjects a university professor to fine and imprisonment if he draws a drop of blood from the animal's toe for a scientific purpose, — then it had certainly become time for the physicians and physiologists of the British Isles to endeavor to inform the public on the vivisection question.

The anti-vivisection craze has now spread to Germany, and there are premonitory symptoms in the United States. Our people in general are too well informed, and have too great confidence in scientific men, to be so easily led

[1] Physiological cruelty; or, fact *v.* fancy: an inquiry into the vivisection question. By Philanthropos. New York, *John Wiley & Sons*, 1883. 156 p. 8°.

astray as the English have been. We shall, moreover, be free from the pressure of a royal court which dislikes biological science, and from the influence of the personal prejudices of the sovereign, still powerful enough in England to have much weight in legislation on questions outside of Whig and Tory politics. Still, American physiology is by no means secure, unless its leaders take warning by the English disaster. They have, in consequence of British legislation, an opportunity to make the United States the chief seat of physiological research among the English-speaking peoples; and it will be a lasting disgrace to them if they let it slip. If, while freely admitting that they believe it their duty to experiment on living animals, they will be on the alert to correct at once the falsehoods and exaggerations of the fanatics; to take pains to teach the public how much the scientific treatment of disease depends on physiological, therapeutical, and pathological research; and to make it widely known how very small a percentage of vivisections involve more pain than that felt by a man on receiving a hypodermic of morphia, — then there is little doubt they will be allowed to carry on without hindrance their beneficent work. The only danger lies in the ignorance of the great majority of ordinarily well-informed people regarding such subjects. Secrecy, not publicity, is what American physiology has to fear.

A HEARING OF BIRDS' EARS.[1] — II.

Let us next confine attention to the ossicles of the ear. Those familiar with these little bones, only as they occur in man or any other mammal, need to be cautioned that their anatomical arrangement, and to a great extent their physiological characters, are very different in birds and other reptile-like vertebrates. Presuming, of course, upon the reader's thorough knowlege of the human case, we will demonstrate these bones in their proper relations and offices in birds, as elements of the lower jaw and hyoid bones (mandibular and hyoidean arches).

The malleus is the proximal element of the meckelian cartilage (figs. 1, 2, *mk*), a gristly rod about which the lower jaw-bone is developed in membrane. Becoming segmented off from the rest of the meckelian rod, it is in mammals withdrawn into the tympanic cavity, disconnected from the jaw-bone, and connected with the incus, its *processus gracilis* lying in the glaserian fissure. The jaw-bone then articulates directly with the glenoid cavity of the squamosal, forming the temporo-maxillary articulation. In any bird the malleus remains outside the ear, and acquires comparatively enormous dimensions, with the peculiar shape shown in fig. 1, *q* (see also fig. 2, *q*). This

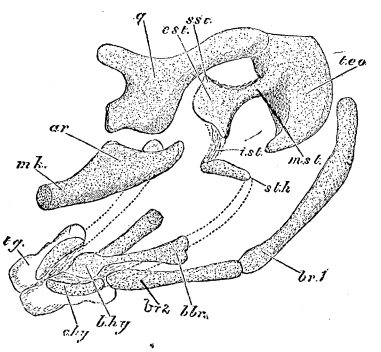

Fig. 2. — The post-oral arches of the house-martin, at middle of period of incubation, lateral view, × 20 diameters. *Mk*, stump of meckelian or mandibular rod, its articular part, *ar*, already shapen; *q*, quadrate bone, or suspensorium of lower jaw, with a free anterior orbital process and long posterior otic process articulating with the ear-capsule, of which *teo*, tympanic wing of occipital, is a part; *mst*, *est*, *sst*, *ist*, *sth*, parts of the suspensorium of the third post-oral arch, not completed to *chy*; *mst*, medio-stapedial, to come away from *teo*, bringing a piece with it, the true stapes, or *columella auris*, the oval base of the stapes fitting into the future *fenestra ovalis*, or oval window, looking into the cochlea, or inner ear; *sst*, supra-stapedial; *est*, extra-stapedial; *ist*, infra-stapedial, which will unite with *sth*, the stylo-hyal; *chy* and *bhy*, cerato-hyal and basi-hyal, distal parts of the same arch; *bbr*, *br*1, *br*2, basi-branchial, epi-branchial, and cerato-branchial pieces of the third arch, composing the rest of the hyoid bone. (After Parker.)

quadrate bone, as it is called in birds, looks something like an anvil, and has often been mistaken for the incus: on the other hand, from its function in supporting the *membrana tympani* in part, it has been malidentified with the tympanic bone (external auditory process). It is very freely articulated at both ends, rocking back and forth with the movements of the jaws. It normally has articulation with five separate bones: 1. By its lower end, which is bitubercular, with the articular piece of the mandible (lower jaw), forming the true temporo-maxillary articulation; 2. By the outer extremity of its lower end with the quadrato-jugal bone (fig. 1, *qj*), which is the posterior element of the zygomatic arch, continued forward by the jugal or malar bone (fig. 1, *j*) to the superior maxillary (fig. 1, *mx*); 3. By the inner extremity of its lower end with the ptery-

[1] Continued from No. 34.